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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 26, 1942

TECHNOLOGY DEPT:

Rough Water Test

See Page 200

A SCIENCE SERVICE PUBLICATION

Do You Know?

In 42 years America has produced 86,000,000 *motor vehicles.*

Iron and steel rank next to cotton and jute as *India's* top industries.

Thirty percent of *passenger cars* on farms are 10 years old or older.

The mines of *Alaska* produced in 1940 over $28,000,000 worth of minerals

Experiments are being conducted to find a practical method of extracting *wax* from filter cake, a sugarcane product.

Brazilian civilian *aviation* clubs now claim a membership of 10,000, of whom about 600 have already completed flight instruction courses.

Successful "planting" of *fish* depends on food, cover, spawning areas, water level and the amount of dissolved oxygen in the water to be stocked.

Among hundreds of *war products* now produced by the automotive industry are cantonment furnaces, gas mask components, and incendiary bomb noses.

An estimated 2,000,000,000 pounds of *household fats* are thrown away every year; each pound would make enough glycerine to fire four anti-aircraft shells.

From *glands and viscera* of meat animals, once waste products of packing houses, come such products as sausage casings, gold-beaters' skins, and perfume bottle caps.

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Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

SCIENCE NEWS LETTER

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MEDICINE

Ants Are Suspected

Usually considered as a harmless pest of tropical regions, when they get into the sugar bowl or other food they probably spread dysentery, may endanger troops.

➤ ANTS that get into the sugar bowl or other food, usually considered a harmless pest of tropical regions, are now incriminated as villains that probably spread dystentery, one of the disease scourges of the tropics which are a special danger to Armies fighting in tropical regions.

Experiments in which ants actually did carry dysentery germs on their feet, leaving a 24-hour trail of the germs wherever they walked, are reported by Dr. Sophie Deller Griffitts, of the School of Tropical Medicine at San Juan, Puerto Rico (*Science,* Sept. 18).

The discovery of the probable role of the ant in spreading dysentery was made through one of those happy laboratory accidents. Ants had never before been incriminated as carriers of disease, though flies and even cockroaches have been. As Dr. Griffitts points out, ants which abound in the tropics and semi-tropics are accepted as harmless invaders to be fought only on esthetic grounds.

"They are driven from sugar, candy or other foods which are then consumed with little thought of contamination," she observes.

In her laboratory, native food, rice and beans cooked together with onions and tomato sauce, was being investigated to see whether various strains of dysentery germs would grow in it and thus to learn whether or not the native food could be a source of the dysentery so common in Puerto Rico. Dysentery germs were inoculated into some of this food in flat, covered glass plates. After 24-hour incubation, the plates were left inverted on the laboratory table until the next morning.

At that time Dr. Griffitts saw on the plates unusual colonies of germs growing "in a pattern similar to miniature rabbit tracks." A few ants were also seen on the table, leaving the plates.

More ants were then caught and in the course of experiments Dr. Griffitts found that the ants could carry dysentery germs on their feet at least 24 hours after walking across material containing the germs. They could thus spread the disease by carrying the germs to food which people eat.

The ants in the experiments were identified by M. R. Smith, of the U. S. Bureau of Entomology, as tropical fire ants, *Solenopsis geminata,* a species very common in Puerto Rico and found in practically every kind of environment.

These ants are found in the tropics, in the West Indies and in extreme southern United States but not as far north as the vicinity of Washington, D. C. Other species of ants such as those found in more northern regions may also be able to carry dysentery germs, although Dr. Griffitts does not report any experiments with other species.

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***A NEW GUN** for parachute troopers is this Reising Submachine gun which has pistol grip and steel-frame stock that fold out of the way when not in use. This type deadly .45 calibre weapon was reportedly employed in the Solomon Islands attack. The photograph, which was taken in training at a Marine Corps Base, is an official photograph of the U. S. Marine Corps.*

AGRICULTURE

Help Chinese Fight Erosion And Grow More Food

➤ TO HELP unoccupied China grow more food for its millions, a scientific mission is setting forth from the U. S. Department of Agriculture at the request of the Chinese government.

Dr. W. C. Lowdermilk, veteran soil scientist who has studied soil problems in all parts of the world, heads the U. S. party that has just left Washington. Dr. T. Dykstra, plant breeder in corn and potatoes, is accompanying Dr. Lowdermilk and later an animal breeder and hydraulic engineers will join them in Chungking.

The need for food in China has been increased by the 60,000,000 refugees who fled inland as a result of the Japanese invasion. Cultivation was pushed up the slopes of the hills and mountains. Crops such as potatoes and corn were more generally grown.

Chinese farmers have been troubled with erosion on the slopes of the hills and this is one of the problems that the American scientists and their Chinese colleagues will attempt to solve.

Dr. Lowdermilk and his colleagues will cooperate in setting up a soil conservation service which will be a permanent organization for the purposes of assuring ample food production in coming years.

The American scientists will work closely with Dr. D. Y. Lin of the Chinese Ministry of Agriculture in Chungking.

Science News Letter, September 26, 1942

INVENTION

Vitamin B_1 Obtained From Waste Yeast

➤ WE MAY need plenty of the morale vitamin B_1 these days, but if we have to give up meat, 40% of our usual supply will be taken away. However, a prolific source and a highly concentrated form of this vitamin, which is thiamin, the antineuritic and antiberiberi vitamin, are described in U. S. patent 2,295,036 issued to Henry J. Gorcica and Harold Levine of Milwaukee and assigned to the Pabst Brewing Company. (See *SNL*, Sept. 19 for another method).

A common source of the vitamin is yeast. Dried baker's yeast, the inventors state, has a vitamin B_1 potency of from 5 to 15 International units per gram. Dried brewer's yeast ranges from 20 to 65 International units. No method has been described for making a yeast with consistently higher potency than 100 units, and none for recovering the vitamin from waste yeast, they say. Large quantities of B_1 are therefore simply thrown away. (The International unit in this connection means 3 millionths of a gram of thiamin to 1 gram of the dried yeast. A gram is the 28th part of an ounce.

The inventors use this waste yeast, together with any other cheaply available substances rich in vitamin B_1, such as rice or barley polish, alfalfa leaf meal, etc., as a culture medium on which to raise a crop of special yeasts particularly voracious of vitamin B_1. Like so many little pigs the yeast cells gobble up the stuff, stimulated also by a plentiful helping of fermentable sugars, and fatten themselves until they contain up to 1,200 International units per gram of the dried yeast.

Another accomplishment of the invention is that by regulating the concentration of B_1 and of the sugars in the food, yeasts can be produced having a predetermined B_1 potency of anywhere from 100 to 1,200 units.

Science News Letter, September 26, 1942

ASTRONOMY

Nova Found in Cygnus

First exploding star to appear in heavens in many months was first observed at Mt. Palomar. Remarkable changes in spectrum will add to knowledge of stars.

➤ THE FIRST NOVA or exploding star to appear in the heavens in many months has been discovered in the constellation of Cygnus by Dr. Fritz Zwicky observing from Mt. Palomar, Calif. Observatories all over the world have begun observations upon the remarkable changes in this star's spectrum which will contribute to the knowledge of stellar structure and of atomic structure as well.

Not quite bright enough to be seen with the unaided eye, the nova now at eighth magnitude is probably as bright as it ever will get. Inspection of astronomical photographs at Harvard Observatory show that it had been photographed more than 50 times since June 8 when it was of about tenth magnitude.

"It is likely that the nova reached its explosive maximum in early spring when too near the sun for discovery," explained Dr. Harlow Shapley, director of Harvard Observatory. "During this summer it has been oscillating between the seventh and eleventh magnitudes. Ultimately it will fade away. Its distance is probably greater than a thousand light years."

Dr. Walter Adams, director of Mt. Wilson Observatory, reported the discovery to Harvard Observatory, American clearing house for astonomical information, whence the news was distributed by radio and telegraph to observatories both in the Americas and in Europe and Asia. Lund Observatory in Sweden relayed the information to observatories in both United Nations and Axis countries.

The spectrum of the nova shows bright bands with multiple absorption components. A complete curve of the light variations is being prepared from the Harvard photographs.

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ASTRONOMY

For Every Nova Discovered, Many Reports Are Checked

➤ ASTRONOMERS at the Harvard Observatory are kept busy from time to time checking enthusiastic reports from astronomers, mostly amateur, who hopefully report objects in the sky which they believe to be new. Occasionally a discovery like the nova in Cygnus is reported, verified and announced to the astronomical world.

During the past month a photographic defect (that was not a comet) was telegraphed from Mexico. A rift in the western twilight (which was not a comet) has been telegraphed from Iowa; a faint star cluster that has been in operation probably ten thousand million years (and was not a comet) has been telegraphically reported from California; and from Oklahoma was telephoned excitedly a dazzling object in the far north (that was not a nova!). The Oklahoma observer telegraphed the next night in confirmation of what the Harvard astronomers had already determined, that "My Nova is Capella; excuse me for making an ass of myself."

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MEDICINE

Syphilis Is Non-Infectious After Brief Treatment

➤ REPORTS that the Army shortly will induct men suffering with venereal diseases and, according to one report, has already begun to do so, should not cause any fear that this step would spread the disease to uninfected men.

Within two or three days after proper treatment for syphilis is started, the patient is not infectious, that is, he is no longer capable of spreading the disease, so far as every day contacts are concerned, officials of the U. S. Public Health Service state. The length of time after treatment has started that a patient may spread the disease through sexual contact cannot be stated so definitely. Experts in syphilis treatment place the upper limit after treatment of infectiousness through sexual contact at five years.

Gonorrhea is very rarely acquired by adults except through sexual contact. Sulfathiazole cures this disease in a large percentage of patients with a few days of treatment.

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ENTOMOLOGY

Farmers Wage Insect War

Hordes of bugs blitz American agriculture. Situation now under control, Department of Agriculture reports. Hessian flies combated by "scorched earth" policy.

➤ THE FARMERS' annual blitz season is on. Warfare raging from the fruit orchards of California through the wheat fields of the middle West, blazing through Southern cotton and tobacco, threatens even Vermont potatoes and the apple trees of Maine. Defense tactics include aerial attack, machine gun sprays, tanks, poison gas, scorched earth and fatal booby traps.

The enemy? Hordes of Oriental fruit moths, potato fleas, boll-weevils, cotton leaf-worms, Japanese beetles, velvetbean caterpillars and hundreds of other varieties of insect. However, the Department of Agriculture's latest communique reports that everything is under control, with only a little mopping up still to be done.

A fresh infiltration of wheat-eating Hessian flies, sweeping East from Kansas to Pennsylvania, are being thwarted by a drastic scorched-earth policy. Since this newest menace is nourished in its larval stage by the juice of tender young wheat stalks, it can be combatted by the ruthless destruction of "volunteer," or random between-crop growths of wheat which offer breeding ground to the thirsty Hessian maggots. It is also circumvented by "delayed seeding," since a touch of frost is harmless to wheat but slows down flies.

Our important wartime crops of peanuts and soybeans have been menaced by white-fringed beetles, leaf-hoppers and velvetbean caterpillars, which can be dusted with cryolite from low-flying airplanes. The white-fringed beetle is a new importation from South America, which research experts in Agriculture's Bureau of Entomology and Plant Quarantine believe is now under control.

The beetle called grape colapsis, fond of soybean in its grub stage, can be foiled by rotation of crops. The cotton season has presented, in addition to the annual boll-weevil menace, an urgent epidemic of cotton leaf-worm, or Alabama ardillacea, which migrates annually from the tropics. Thanks to calcium arsenate, dusted from airplanes, this is now under control, except for the northern edge of the cotton belts. Entomologists are now working on a new cotton pest—the pink boll worm. Except for a few enemies such as the Gypsy moth, crickets, and grasshoppers, government entomologists content themselves with research, information service, and regulation of harbor and inter-state plant quarantine, letting the farmers carry on the actual warfare.

An ever-present problem are the innumerable pests which eat stored grain, wool, and tobacco in warehouses, requiring a vigilant policy of fumigation and "dusting the air" with arsenate compounds.

Although nicotine bentonite is sometimes used in spraying fruit, the most common defense weapon is arsenic, now being absorbed by the war against human enemies. Although no shortage of arsenic has been felt so far, farmers and government experts are not too hopeful about next year's supply.

Fruit pests alone number between 250 and 300 varieties, while another myriad of species attack potatoes, vegetables and all forms of truck crops. Booby traps composed of poison bait are used for some varieties: spraying, dusting, rotation of crops for others. The corn earworm can sometimes be fooled by breeding longer husks on corn. Those worms you'll be finding in your apples this fall are most apt to be youthful codling moths or Oriental fruit moths.

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CHEMISTRY

Chemical Solves Problem Of Protecting Steel Cans

➤ LACQUERS, used to protect untinned steel cans from corrosion, sometimes have a corrosive effect all their own on the steel, so that something is needed to protect the can from the lacquer. Fortunately an organic chemical has been found which does this. It reacts with the metal to form a thin strongly attached film which the lacquer cannot soften or dissolve.

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Alaska, with its 590,884 square miles of territory, is one-fifth the size of the entire 48 States.

FRONT LINE SURGERY—The same sort of pressure cooker used by housewives in the United States for putting up the vegetables and fruits from their victory gardens serves at the front lines in China to sterilize instruments. This photograph is furnished by United China Relief, which organization is providing funds for such emergency medical work.

MEDICINE

Improve Cancer Therapy

X-rays of 3,000,000-volt energy used for treatment of malignancies. Much greater depth dose permitted than by using radium. Results reported encouraging.

➤ THE EXPERIMENTAL treatment of cancer with X-rays generated by 3,000,000 volts of energy is described by two Boston scientists. Dr. Richard Dresser told members of the American Roentgen Ray Society meeting in Chicago, that the high intensity of the ray created by the experimental machine permits a depth dose much greater than has been obtained even with great amounts of radium.

Prof. John Trump of the Massachusetts Institute of Technology described the physical characteristics of the extremely short ray. Operating on the electrostatic principle, by which static electricity is produced by friction, the apparatus is insulated by air under pressure.

A small number of selected patients have been treated by Boston doctors with rays created by the new machine. Results so far have been encouraging.

Dr. Dresser told the medical specialists in radiology, that the 3,000,000 volt X-rays have essentially the same physical properties as gamma rays of radium. The penetrating effect of these rays of such extremely short wave length is such that the maximum therapeutic (treatment) effect occurs not on the patient's skin, but some distances below in the subcutaneous tissue.

Thus the new machine may make possible larger doses of radiation directed at deep-seated malignancies (cancers) with proportionately less effect upon the skin and adjacent normal tissue.

"These preliminary clinical findings substantiate the observation that as the wave length of an X-ray beam is decreased, the skin tolerance and depth dose are increased," declared Dr. Dresser.

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RESOURCES

Houses Needed After War

➤ ABOUT A MILLION new homes per year could be used by Americans during the decade following the war, if they are built in the right places at the right prices, it is estimated in a report issued by the National Resources Planning Board.

Besides this there will still be a need for a large volume of repair during the same period.

This potential boom in home building has developed because only three new dwellings have been built for every five additional families which have been formed during the last decade, and because of the drastic curtailment of housebuilding during the war years.

Wartime housing will take care of only acute needs, it is warned by Miles L. Colean, author of the pamphlet released by the Board. It is also likely, he says, that many war dwellings will not be in the areas where they will be needed after the war. Meanwhile, out dated and worn out houses throughout the country continue to deteriorate.

"If we had better means for providing attractive, low-priced houses," the report says, "a huge demand would exist for the replacement of these deteriorated and outmoded dwellings amounting perhaps to as much as one-fifth of the total stock of around 37,000,000 dwellings, or something over 7,000,000 units ripe for replacement."

About 2,000,000 of these are needed on farms alone, the U. S. Department of Agriculture reports.

Continued research in materials and techniques is recommended as one of the long range methods of solving this housing problem.

This statement recalls plans by some authorities for standard models of houses. They believe this would be a big help, just as standard auto models have made new cars available to most families in the past. These houses would roll off assembly lines in mass production to be assembled in sections with a minimum of expensive "custom tailoring" at the building site.

New building materials are also likely. Some foresee the use of plastic-and-plywood walls with a stainless steel roof. Such a house would be strong yet so light that two men could lift the whole wall of a room as they put it up.

Application of scientific research should bring prices down to where the new homes would mushroom up all over the country by the hundred thousand, some economists believe.

Price has been the main drawback in the past, although it is being steadily reduced. In 1925, dwellings were built for around $4,800 per unit, while in 1940 the average price was down to $3,700.

Other steps outlined in the report as possible aids to accelerating the postwar building program included removal of legal restraints within the house-building industry; preparation of model building codes by the government based on ample engineering service and providing localities with facilities for consultation and testing; and improvement of present government aids for providing adequate housing for Americans.

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MEDICINE

Cancer Fighters in Uniforms Broaden Scope of Work

➤ NOW IT'S the WFAS who are donning uniforms and attending officers' training school as the Women's Field Army of the American Society for the Control of Cancer swings into action with a new war service program.

The fight against cancer is still the prime concern of this feminine army of 225,000 volunteer workers in every state in the Union. But with the war putting additional burdens on doctors, nurses and health educators in every community, the WFA, according to its National Commander, Mrs. Marjorie B. Illig, will broaden its service by organizing in each community a health education unit, a medical aide unit and a hospital unit.

Right now 80 women are attending the first National Training School for officers of the WFA at the Jackson Memorial Laboratory for Cancer Research. The course, under the direction of Dr. Clarence C. Little, managing director of the American Society for the Control of Cancer, covers such subjects important in the fight against cancer as normal and abnormal growth and aging, endocrine glands, and methods of cancer research.

The women taking the course will hear lectures and see demonstrations on diagnosis and treatment of cancer at Memorial Hospital in New York City.

An important requirement for graduation from this officers' training school is that each officer shall present a certificate signed by her physician stating that she has had a complete physical examination during the year 1942. Object of such examinations in the cancer control program is the detection of cancer, if present, in its early, most curable stage.

After graduation, the plan is for these 80 trained officers of the WFA to conduct similar schools in their own states.

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RESOURCES

British Reopen Ancient Tin Mines In Cornwall

➤ ANCIENT TIN mines in Cornwall, England, are again being worked since the loss of the Malayan tin mines to the Japs. Cornish tin, the famous product of ancient Britain, had a profound influence on early culture and prehistoric commerce, such as trade with the Phoenicians. Today, many of the mines are extremely deep, often over 2,000 feet. Deepest of all is the Dolcoath, reaching a depth of over 3,000 feet.

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EDUCATION

China's Schools Carry On

University faculty slips through Japanese lines to continue teaching "somewhere in China." Conquerors ruin scientific material. Japs reported slowed by malaria.

➤ HIGHLIGHTS on how Chinese universities are carrying on in spite of Japanese invasion and oppression were related at the meeting in Buffalo of the American Chemical Society by Prof. Clinton N. Laird of Lingnan University, who returned with Mrs. Laird on the *Gripsholm* after a wearing time in an internment camp in Hong Kong.

Questioned about causes for the recent Japanese reverses and retirements, Prof. Laird said he thought one factor might be disease, especially malaria. The Japs depend more on atabrine than they do on quinine for treatment of malaria, and since their former bulk source of atabrine in Germany has been cut off they appear to be hard up for the drug.

The faculty at Lingnan, originally located in Canton, consisted about five-sixths of Chinese professors, one-sixth of Americans, he stated. Most of the Americans who were in Canton when the Japs broke in were seized and eventually returned on the *Gripsholm*. A few remain on the campus, looking out for the property as well as they can. Some had gone inland when the University sent its school of agriculture and its college of liberal arts into unoccupied China ahead of the Japanese onrush.

Practically all Chinese faculty members have slipped through the Japanese lines, one by one, and have made their way to join their colleagues "somewhere in China," where the college year took up again in July at the point where the invaders interrupted it in December.

Much the same tale can be told, Prof. Laird states, for other educational institutions in China: Americans interned and ejected, but Chinese teachers escaping the Jap net and resuming their work at remote inland posts, where the warring Chinese government has gladly furnished working quarters.

Scientific work is badly interrupted, for little of the necessary equipment could be carried away. However, they have some, and small amounts of absolutely indispensable materials are being manufactured by the Chinese themselves. Chinese skill in "make-do" bridges the gaps.

Japanese handling of captured scientific material has been stupid in the extreme, Prof. Laird stated. Soldiers breaking into laboratories ruin what they do not understand, pouring valuable medical supplies down the sink and dumping out critical industrial materials to spoil, even though their own factories back home are badly in need of some of the stuff.

Prof. Laird said that although the internees in his camp were kept on exceedingly short rations by their captors, they were not otherwise ill-treated. He said that the average healthy person lost about 20 pounds, and that those in ill health lost nearly double that. His wife, who was just recovering from an operation when they were captured, suffered a 40-pound loss in weight. She is now in a Philadelphia hospital, continuing her recovery.

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***LIFE-SAVING SUIT**—This new self-buoying garment, made by the B. F. Goodrich Company, has a "built-in" flashlight, knife, and whistle. It is also provided with yellow hood and yellow-palmed gloves to aid rescuers in sighting the wearer. Weighted soles keep the wearer in upright position so that he floats head and shoulders above the water.*

Molds are more resistant to acid soil than are bacteria.

RADIO

Magnetic Storms May Be Due To Holes in Radio Layers

➤ MAGNETIC STORMS which interrupt radio communications and cause magnetic needles to get jumpy may be due to holes in the ionosphere, those conducting layers high above the ground that reflect radio waves back to earth. The holes are punched by streams of atomic fragments from the sun.

This view is expressed by T. L. Eckersley of Marconi's Wireless Telegraph Co. Ltd. (*Nature,* Aug. 8).

The streams from the sun, he believes, are neutral, being composed of equal numbers of positively charged protons and negatively charged electrons. The protons being heavier penetrate the atmosphere more deeply so that two oppositely charged layers are formed, the protons below, the electrons above. But a localized neutral stream may sweep a space clear of charged particles thus leaving a hole in the ionosphere. This is the cause of a magnetic storm, Mr. Eckersley believes.

He finds much evidence for the existence of these holes, but the mathematics of the matter has not been completely worked out because the density of the particles in the stream is not yet known.

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PHARMACY

Sugar Shortage Puts New Ingredients in Syrups

➤ SYRUP which your corner druggist often uses to suspend the latest medicines as well as make the "soothing syrup" of grandma's day, now may contain new and strange ingredients due to restrictions on use of sugar.

Irish moss, locust bean gum, tragacanth, hog gum—all are being experimentally used as thickening agents, mixed with the soluble form of saccharin in an effort to find a completely satisfactory syrup in which to suspend medicines taken in this manner. Work being done is reviewed by Dr. C. Lee Huyck of the Research Laboratories, Wm. S. Merrell Co. (*Journal, American Pharmaceutical Association, Practical Edition,* July).

The snowy white crystals of the chemical, saccharin, are around 280 times as sweet as sugar, pharmacists tell us, so a little bit will go a long way.

Some difficulty has been encountered in making this into a smooth tasty syrup with the materials available, however. Tragacanth, for example, one of the druggists best gummy substances for this purpose, comes from shrubs growing on the mountain slopes of Asia—not a particularly good source right at present. Imports of the locust bean have also been cut off.

Irish moss and sodium alginate look most promising, Dr. Huyck reports. We get these from forms of sea weeds obtainable in this country.

London Hospital reports the use of the chemical methyl cellulose with chloroform and saccharin in water, but this type of substitute often forms a feathery unsightly sediment which makes the medicine undesirable for use.

A variant of a British syrup of marsh mallow is said to be good, using saccharin instead of the usual sugar. This is obviously not made from the puffy white candies, pharmacists smilingly warn, but from the white root of an herb often found growing in our marshes.

Science News Letter, September 26, 1942

ASTRONOMY

Furnace Used to Learn About Properties of Stars

➤ TEMPERATURES of the stars and their composition are now more accurately determined with the help of an electric vacuum furnace, described by Dr. Arthur S. King of the Mount Wilson Observatory in California. A hollow carbon is filled with some substance to be tested and this is vaporized in the furnace. The light of the incandescent vapor is then examined with the spectroscope which spreads the light into a rainbow band, the spectrum. The spectrum of a substance varies with the temperature. New "lines" appear and old ones fade as the temperature rises.

With the furnace, the precise temperature can be determined at which a spectrum of a certain type appears. If a star shows a similar spectrum, it must contain that substance and have that temperature.

Hitherto, substances were vaporized in the flame, the arc, or the spark. The spark is the hottest, but its temperature is not accurately known, and is not easily controlled. The new furnace eliminates these difficulties, but so far reaches only to the temperatures of the cooler (red) stars, several thousand degrees Fahrenheit.

Science News Letter, September 26, 1942

IN SCIENCE

AERONAUTICS

New Navy Scout Plane Is Now in Active Service

See Front Cover

➤ THE SEAGULL, new scout-observation plane for the U. S. Navy, is shown in the photograph on the front cover of this week's SCIENCE NEWS LETTER taking its rough water test.

The plane, now in active service, is designed to serve as the "eyes of the fleet." It is claimed by its designers to be the fastest battleship and cruiser-based plane operated by the U. S. fleet, but actual performance data have not been announced.

It is equipped for either land-based operations or for catapult operations from battleships or cruisers and has a wide range of operating speeds.

The Curtiss-Wright Corporation, the makers of the Seagull, are pleased that the first of these new planes is assigned to the new cruiser *U. S. S. Cleveland,* because much of the precision machinery used in building the plane was produced in the Cleveland, Ohio, area.

Science News Letter, September 26, 1942

TOPOGRAPHY

Nazis Would Find Caucasus Mountains Hard to Cross

➤ THE NAZIS would have a tough job if they attempted to cross the Caucasus mountains in their drive toward the Caspian oil-fields.

The Caucasus are high, steep, rocky mountains which have easily defended narrow valleys leading to mountain passes. They have ten peaks higher than America's highest, Mt. Whitney. In fact, the highest mountain of Europe is 18,000-foot Mt. Elbrus in the Caucasus.

The Urals, on the other hand, often spoken of as a safe natural barrier to Nazi penetration, would be classed as "a bunch of hills" by any Western American. In general they do not rise above 6,000 feet and are similar in character to our own Appalachians.

Science News Letter, September 26, 1942

NE FIELDS

PHARMACY

Australians Can Produce Much Needed Opium

➤ OPIUM POPPIES can be grown satisfactorily in parts of Australia, the Council for Scientific and Industrial Research reports.

This news comes at a time when imports have been cut off from the Far East and other former sources. United States officials are keeping a watchful eye on our dwindling stockpile of opium from which valuable medicinals are obtained.

Analysis of Australian opium indicates that its morphine content is variable but has commercial possibilities.

Progress has been reported in extracting morphine directly from the dried whole plant. The present method obtains opium from the poppies by cutting the unripe seed capsules and collecting only the milky juice which exudes.

Science News Letter, September 26, 1942

PSYCHOLOGY

Children Fear Separation More Than They Do Death

➤ CHILDREN between the ages of 7 and 13 reflect the cynical, disillusioned attitude prevalent after the last war, with no positive idea of what we are fighting for this time, according to a study made in New York on the children's ward by two Bellevue Hospital psychiatrists, Dr. Lauretta Bender and Dr. John Frosch.

The war so far has had no disturbing mental effect on these children, although they reacted with fear and anxiety to the threat of being separated from their parents. This conclusion, confirming British blitz experience, is reported by Dr. Bender and Dr. Frosch (*American Journal of Orthopsychiatry,* October).

Although the children agreed that "war was bad," war has no very personal meaning to the average young child, according to these psychiatrists. Death and killing do not mean the same to them as to adults. In the few cases of anxiety over the war, this seemed to be due primarily to personal, emotional problems at home. "Glorification of war was conspicuous by its absence and surprisingly few thought of war in terms of bravery, heroism, freedom and patriotism," these observers found. "If anything, there was a glorification of peace."

Toward the end of the study, however, a change could be observed, reflecting a change in public opinion. There was more emphasis on a global war, with the Nazis and the Japanese seen as a common enemy. Most of the children thought of the war as a fight between the "haves" and "have-nots" with practically no mention of freedom versus tyranny.

Science News Letter, September 26, 1942

RESOURCES

AA-2X Preference Rating On Lumber for Army Models

➤ FURTHER OFFICIAL recognition of the importance of model airplanes to America's war effort was given by the War Production Board through the issuance of an AA-2X preference rating for lumber which is used for the making of models needed by the First Fighter Command of the U. S. Army Air Forces.

Conservation Order M-208 issued by the War Production Board on August 21, 1942 (probably the first order in which preference ratings were set up simultaneously with the issuance of the order) applies to all softwood lumber of all species, grades and sizes; except shingles and lath, plywood, veneer and used lumber.

Immediately after issuance of this order which seemed likely to reflect adversely upon the production of airplane models for use by the Fighter Command, Science Service sought further clarification of the order. This has just been issued by the WPB.

"Since the planes are to be delivered to or for the account of the Army or Navy of the United States, all purchase orders for softwood lumber covered by Conservation Order M-208 may bear a preference rating of AA-2X for the lumber needed. This would be a Class 2 order. We would like to call your attention to the fact that this rating would not be applicable to Balsa Wood."

Now all lumber dealers can feel assured that they will be able to replace their stocks of softwood lumber which they sell to these model builders.

Science News Letter, September 26, 1942

INVENTION

Silver-Tipped Tool Heats Rivets for War Industry

➤ A SILVER-TIPPED tool for heating explosive rivets, and thereby causing them to explode, is the invention of Lawton A. Burrows and Roger W. H. Gentry of Woodbury, N. J., and Davis L. Lewis, Jr. of Swarthmore, Pa., who have received patent 2,295,075. The rights have been assigned to E. I. du Pont de Nemours & Company.

Explosive rivets have been often described. They are much used in airplane and other construction where it is impossible to get at the other side of the structure to back the rivet. The explosion forms the head on the far end.

In heating these rivets, the inventors explain, the heat must be applied only to the rivets, which are often no more than one-quarter inch in diameter, and the heat must be carefully regulated. If the adjacent metal is heated, it will expand and the joint will not be tight.

The heater devised by them resembles an electric soldering iron, but has a small rounded tip which, they say, must be a good conductor of heat, preferably silver. The tool also has a pistol grip and an extensible front support, like an ancient musket, to steady it and guide it accurately to the work. It also has means for regulating the heat.

Science News Letter, September 26, 1942

METALLURGY

Air Bubbles Save Metal From Low-Grade Ores

➤ QUANTITIES of precious copper, zinc, lead, nickel, tungsten, chromium and other strategic metals are being rescued from low-grade deposits and mine wastes by air bubbles, which float them to the surface. The low-grade ores are ground in water and small amounts of chemicals are added which selectively attach themselves to the grains of the valuable minerals and float them to the surface.

This process of "froth flotation" has been used for many years, but E. I. du Pont de Nemours & Company announce the development of new chemicals by themselves and others which improve the process and make it more economical. The precious minerals are skimmed off the surface and subsequently smelted and refined, thus adding to the supply for our war implements.

Science News Letter, September 26, 1942

ASTRONOMY

Ringed Planet Back

Saturn, first seen imperfectly by Galileo in 1610, will be visible in the constellation of Taurus, the bull, in the October evening skies.

By JAMES STOKLEY

➤ AFTER SEVERAL months with no planets easily visible in the evenings, Saturn, the one with the rings, is in view again for the first time since April. Then it passed behind the sun, and out of sight. By June it had become a morning star, seen in the east before sunrise. After that it gradually moved east until now it rises about two hours after sunset, and is on view for the rest of the night.

The accompanying maps show its position. These depict the heavens as of 11:00 p.m., war time, at the beginning of October, about 10:00 p.m. on the 15th and 9:00 p.m. on the 31st. Saturn is in the constellation of Taurus, the bull, close to the star Aldebaran. On the astronomer's brightness scale, its magnitude is zero, nearly two and a half times as bright as Aldebaran, a 1.1 magnitude star.

Nearly as bright as Saturn is the most brilliant star to be seen these evenings. This is Vega, in Lyra, the lyre, high in the west. And only slightly fainter than Vega is Capella, in Auriga, the charioteer, which is in the northeast just to the left of Taurus. Altair, in Aquila, the eagle, comes third. It is found in the southwest. Aldebaran is fourth in order of magnitude, while the fifth is Fomalhaut. Part of the constellation of Piscis Austrinus, the southern fish, it is low in the south. Because it is so near the horizon, for northern hemisphere observers, the earth's atmosphere absorbs much of its light. Hence it does not appear any more brilliant than some second magnitude stars higher in the heavens. This circumstance is indicated by the symbol used to designate Fomalhaut on our map.

Deneb Bright

The last of our October evening first magnitude stars is Deneb, in Cygnus, the swan. High in the west, part of this constellation is shown on the southern map, and part on the northern. The principal part of Cygnus is often called the "northern cross." It does make a very good cross in nearly a vertical position, one even more perfect than its more famous southern counterpart. Deneb is at the top of the northern cross.

About midnight another planet rises in the east. This is Jupiter, which is about 5.25 times as bright as Saturn. It is in the constellation of Gemini, the twins, near the stars Castor and Pollux. Venus may be glimpsed low in the east just before dawn at the beginning of the month, but it is drawing into line with the sun, when it will not be seen. Mars is likewise now invisible, and so is Mercury for most of the month. However, it will reach its greatest distance west of the sun on October 26, when it will appear low in the east before sunrise for a few days.

Beautiful though it is to the naked eye, Saturn is even more interesting through a telescope, even one of only moderate size, for then its famous rings may be seen. This ring system is exceedingly thin for, while 170,000 miles in outside diameter, it is something like ten miles in thickness.

Rings on Edge

Twice in each of the 29½-year periods in which Saturn makes a trip around the sun the rings are exactly on edge to the earth—then they vanish, even through the largest telescopes. But now we are nearly between two such times, and the rings are spread out nearly to their maximum. This accounts for the great brightness of Saturn. In their present position they reflect back to earth nearly twice as much light from the sun as does the ball of the planet.

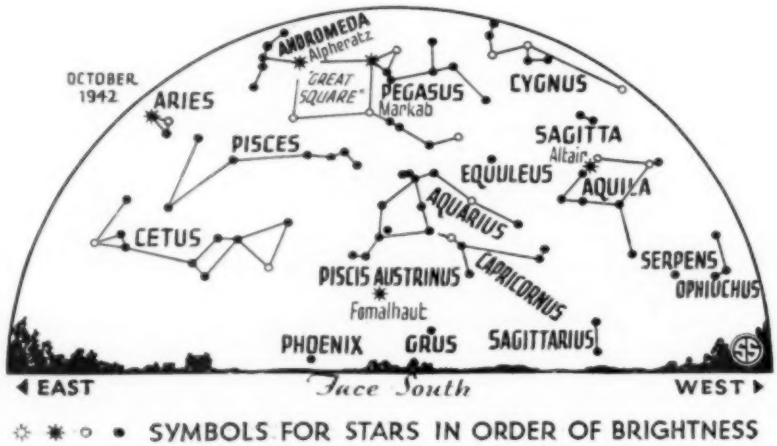
First seen very imperfectly in 1610 by Galileo in Italy through his little telescope, the fact that they were rings was not discovered until 1655, when the Dutch astronomer Huygens found out what they were. He, however, did not appreciate their structure. During the past century it has been established that they are made of a swarm of myriads of tiny moons, revolving around the planet so close together that they present an appearance of solidity.

Nature of Rings

The modern conception of the size of these particles is expressed by Dr. Fred L. Whipple, of the Harvard College Observatory, in his recent excellent book, "Earth, Moon and Planets," as follows:

"The particles of Saturn's ring are probably small, like ordinary dust, but not so small that light pressure might force them away. We can visualize the rings as consisting of broken rocks, pebbles and dust (not as fine as white flour), summing to a total of perhaps one millionth Saturn's mass, or less than a hundredth that of the moon."

Last month there was a partial eclipse of the sun, not, however, visible from settled parts of the world. Then the moon came partly in front of the sun. This month there is another sort of "eclipse," properly called an "occultation," when the moon passes in front of the bright star Aldebaran. Of all the stars in front of which the moon can go, this is the brightest. There have been several such occultations of Aldebaran during recent



months, but many have occurred during daylight hours, at least for part of the United States. However, the one that comes this month, during the night of October 26, will be seen throughout the United States. The moon will then be 17 days old—in a gibbous phase between full and last quarter.

Star Vanishes

As seen from Washington, at 2:11 a.m. E.W.T. on Oct. 27, the dark edge of the moon will hide the star. A curious feature of such an event is that the star vanishes instantly—even more rapidly than an electric lamp goes out when you turn off the switch. This is a good demonstration that the moon has no appreciable atmosphere. If it did, the star would gradually dim before it disappeared, just as the sun gets fainter before it sets behind the horizon. About an hour and a half later, at 3:37 a.m. E.W.T., as seen from Washington, the star reappears, again instantaneously, from behind the edge of the moon on which the sun is shining.

At other parts of the country, the times are different. The astronomer's bible, the "American Ephemeris," published annually at the U. S. Naval Observatory in Washington, gives the times of occultations not only for that city, but for three other locations. One is in western Massachusetts, where the star will disappear at 2:23 a.m. E.W.T. and return at 3:51 a.m. For a point in southern Illinois disappearance comes at 12:46 a.m. C.W.T. and reappearance at 2:11 a.m. The last location for which data are given, in southern California, will see the star hidden at 10:17 p.m. P.W.T. on the 26th, with it emerging at 11:21 p.m.

If you want to see this occultation to best advantage, a pair of binoculars will be a great help. It will be visible to the naked eye, but the optical aid will make it even clearer — particularly the reappearance, for the part of the moon from which the star will emerge will be quite brilliant. Astronomers will be watching this occultation mainly for the purpose of checking accurately its timing. Exact prediction of the moon's wandering is one of the most difficult problems of celestial mechanics, and occultations provide a valuable check on these predictions.

Celestial Time Table for October

Oct.	EWT	
1	9:00 p.m.	Moon farthest, distance 251,200 miles.
2	6:37 a.m.	Moon in last quarter.
3	12:13 p.m.	Moon passes Jupiter.
5	8:00 p.m.	Mars and sun in line.
9	4:44 a.m.	Moon passes Venus.
10	12:06 a.m.	New moon.
14	1:00 a.m.	Moon nearest, distance 228,700 miles.
16	6:58 p.m.	Moon in first quarter.
24	12:05 a.m.	Full moon.
26	11:00 a.m.	Mercury farthest west of sun.
27	Early a.m.	Occultation of Aldebaran (see article for details).
	7:20 a.m.	Moon passes Saturn.
29	5:00 p.m.	Moon farthest, distance 251,600 miles.
31	12:49 a.m.	Moon passes Jupiter.

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MEDICINE

New Use for Heparin

➤ A NEW use for heparin, anti-blood clot chemical, is suggested by experiments reported by Dr. Floyd Boys and Dr. Ivor David Harris, of Charlottesville, Va., at the meeting of the American Roentgen Ray Society in Chicago.

The inflammation resulting from X-ray damage to the lungs may be prevented, or at least reduced in severity, by means of heparin, preliminary results of studies with rabbits show.

The possibility of using heparin for this purpose was suggested by previous studies by Dr. Boys and associates which, they reported, showed that the adhesions sometimes following operations within the abdomen might be prevented by heparin.

Science News Letter, September 26, 1942

Relief from Asthma

➤ "BENEFICIAL RESULTS" and relief of asthmatic paroxysms in nearly three-fourths of a group of asthma patients were obtained by X-ray treatments, Dr. Ira I. Kaplan and Dr. Sidney Rubenfeld, of New York, reported.

The longer and more severe the illness, the more favorable was the response, the doctors stated. Often the symptoms got worse following treatment before they got better.

The patients were mostly men between 30 and 50 years who were allergic to various proteins but who were not helped by desensitization treatment. The X-ray treatment was given two to three times a week over the chest, occasionally over other parts of the body.

Science News Letter, September 26, 1942

ENTOMOLOGY

Roaches and Bedbugs Used To Test Insect Sprays

➤ USING hundreds of thousands of roaches and bedbugs during five years of research at Ohio State University, Dr. F. L. Campbell and associates have originated three procedures which would enable the consumer to buy insect sprays specially adapted and tested against the type of insect to be controlled.

Experiments show that former standard test methods using houseflies, often do not give an accurate picture of what the effectiveness of sprays will be against crawling insects, such as roaches or bedbugs. The research was sponsored by the National Association of Insecticide and Disinfectant Manufacturers.

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● RADIO

Saturday, October 3, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. George E. Folk, special patent adviser to the National Association of Manufacturers, will talk about patents in industry.

Tuesday, September 29, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

CHEMISTRY

Butyl Tires Prove Good

➤ BUTYL RUBBER tires in actual tests on New Jersey highways have shown a life of 20,000 miles if kept below a maximum of 40 miles an hour, J. P. Haworth and F. P. Baldwin of the Esso Laboratories reported before the meeting of the American Chemical Society at Buffalo.

Some plants for the production of this type of rubber are already in production. Others are under construction. By a year from this fall the total production of butyl rubber will reach an annual rate of 130,000 tons.

Possibilities of "tailor-made" rubber for the different parts of a tire were pointed out. In the average light car tire, weighing about 12 pounds, only about four pounds is in the conspicuous part, the tread. Requirements for tread are different from those of side wall, and these in turn differ from those of carcass and inner tube. Synthetic rubbers can be given properties to suit the uses to which they will be put, which is not possible with natural rubber.

Perbunan, a highly specialized kind of synthetic rubber made of butadiene and acrylonitrile, was described by three other Esso Laboratories chemists, R. A. Moll, R. M. Howlett and D. J. Buckley. Acrylonitrile, a derivative of ethylene, comes, like butadiene, from oil and natural gas. One of its ingredients, hydrocyanic acid, can also be manufactured out of natural gas plus nitrogen from the air.

Perbunan's special claim to consideration is its high resistance to oil and gasoline, which makes it well adapted for use in self-sealing tanks for fighter planes, linings for filling-station hose, gaskets for oil pumps, and any other jobs involving exposure to oil.

It is also highly resistant to wear and quite resilient. This would make it an excellent tire rubber; but it is difficult to handle in manufacturing processes, so that its cost is high—somewhere between two and three times that of natural rubber. It should, however, make excellent tread blocks for tanks, a use that does not involve so much hand work as the preparation of tires.

Science News Letter, September 26, 1942

ETHNOLOGY

American Indians Need Proof of Native Birth

➤ EVEN AMERICAN Indians must prove they were born here! Qualified Indian workers have sometimes not been able to get war jobs, the Office of Indian Affairs reports, because they cannot produce birth certificates as proof of citizenship. A simplified procedure has now been worked out for granting delayed certificates based on Indian agency records.

Science News Letter, September 26, 1942

TYPOGRAPHY

New Type Dress And SNL Cover

➤ TO ANSWER the inquiries of those who have noticed the typographical face lifting that these pages have experienced:

The top line of the two-column headings are Airport Semi-Bold with a bank of Futura Medium, while the one column heads are Futura Demi-Bold, types that march along together in harmony. The text type is, as it has been, Granjon, picked for its ease of reading. The little arrow do-dads at the beginnings of articles are more attractive and easier to set than the two-line initial letters used previously. Descriptions of illustrations are in Cloister Bold.

The new cover keeps the general style of the old with more color and more illustration, thanks to the design of J. Benton Webb.

Science News Letter, September 26, 1942

MILITARY SCIENCE

Show First Breech-Loader At Smithsonian in Capital

➤ THE FIRST breech-loading rifle ever used in battle is in the weapons collection of the Smithsonian Institution in Washington, D. C. It was carried by its inventor, Maj. Patrick Ferguson of the 71st Highlanders, in the Battle of King's Mountain in 1780, where he lost his life. Some 150 or 200 of his men were armed with similar rifles, and since the battle was decisively won by the Southern mountaineers fighting in the Revolutionary cause, most of these were either broken or captured in the action, and have become scattered and lost. Occasionally a Ferguson rifle still turns up in some one's barn or attic.

The breech mechanism is simple and interesting. A quick-acting screw runs vertically through the barrel, attached to the trigger guard as a handle. One full turn opens the breech. Loading is easy, and for the date of the invention, remarkably rapid. Maj. Ferguson fired his rifle six time a minute in a test before British ordnance officers at Woolwich Arsenal in 1779.

The rifle in the Smithsonian collection, Maj. Ferguson's personal weapon, is a beautifully executed specimen of gunsmith's work. Its barrel is 31 inches long. The bore is of .70 caliber, and there are eight grooves.

Maj. Ferguson has been given a bad name by some Revolutionary historians, but this does not seem to have been wholly deserved, according to Gen. Watts de Peyster, American Civil War officer through whom the weapon came to the Smithsonian Institution. Gen. de Peyster found a passage in one of Maj. Ferguson's letters home from the Colonial front, in which it is indicated that the Scottish officer once had an easy shot at Gen. Washington (though he did not know who it was at the time) but would not fire because it seemed a most unchivalrous thing to do.

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To supply agriculture's *nitrogen* requirements for fertilizer during the coming year, an estimated 400,000 tons must be made available, less than half of which can be supplied from organic vegetable and animal byproducts.

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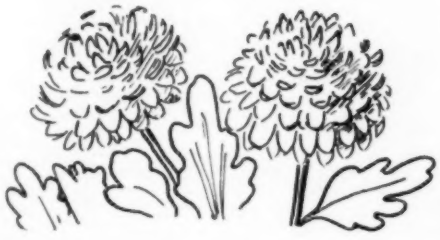
TAXONOMY

NATURE RAMBLINGS

by Frank Thone



Clipped Names

➤ OUR unwillingness to name things by their full names sometimes results in rather impossible abbreviations.

We call chrysanthemums simply "mums" and gladioli merely "glads", in blithe disregard of the fact that the former is hardly more than the Latin ending for a neuter-gender word, and the latter actually an enlargement rather than a diminution of the name. For "gladiolus" is Latin for "little sword" (the reference is to the shape of the leaves), whereas if you drop the diminutive ending, "-olus", what remains is the root-word for a whole, big sword.

We don't truncate all plant names thus, even where lack of common English names forces us to use Latin or Greek polysyllables. Nobody, for example, calls an aspidistra an asp, or a nasturtium a nasty, or a ginkgo a gink, or a magnolia a mag. And nobody would dream of referring to a heliotrope by only the first syllable of its name, whether with long or short pronunciation of the vowel.

We have the same curious habit of chopping animal names in two, with similarly absurd results if we stop to think of original meanings. Thus, we call a hippopotamus a "hippo." Well, the full-length word means "horse of the river"; *hippo* means merely horse—which the animal certainly doesn't greatly resemble. Rhinoceros is commonly shortened to "rhino." But the full name means "nose-horn"; *rhino* means just nose. The shortened name would seem to be more appropriate if applied to a tapir or an ant-eater or an elephant.

Perhaps the height of absurdity is reached in shortening orang-utan to orang. *Orang* is a Malay word meaning man; *utan* means forest or woods. Orang-utan therefore signifies man-of-the-woods. But *orang*, taken by itself, is the designation for human beings.

Even in the microscopic world, we have the same tendency to clip names regardless of mangled meanings — and that by the scientists themselves. Thus, bacteriologists commonly use the abbreviations "strep" and "staph," when they mean respectively streptococcus and staphylococcus.

Science News Letter, September 26, 1942

Books

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SCIENCE NEWS LETTER

1719 N St., N. W. Washington, D. C.

THE NEW NAVY "E"-with-star—awarded first to Bausch & Lomb—is official recognition of continued accomplishment in Production for Victory. It symbolizes a singleness of purpose that justifies any sacrifice you or we may be called upon to make.

American War Birds Have Keen Eyes

FOR America's fighting forces, strictest requirements are imposed on the men who fly the fighter planes. Stamina, keen perception and split-second timing depend on condition. In the most critical physical examinations, particular emphasis is given to perfection of vision.

Several years ago, at the request of U. S. Army officials, Bausch & Lomb developed a special anti-glare glass for use in bright overcloud flying. This glass, known as Ray-Ban, has the remarkable property of filtering out excess glare-producing light, at the same time transmitting most of the light useful for seeing. Army, Navy and airline pilots—as well as target shooters and motorists—have welcomed the cool, comfortable, keen vision that Ray-Ban affords.

So, again, and in still another way, Bausch & Lomb gives aid to America's all-out for Victory. Its other contributions, more obvious, include gunfire control equipment—range finders, binoculars, aerial height finders. Behind the scenes, but of no less importance, are the instruments of industrial research and production—metallographic equipment, spectrographs, toolmakers' microscopes, contour-measuring projectors. Bausch & Lomb eyewear products—eye examination instruments, spectacle lenses and frames—keep a nation of workers at top visual efficiency.

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STATISTICS

Accidents Kill More Persons Than Bombing

➤ SINCE the beginning of the war, the German Luftwaffe has killed 43,000 English civilians in the greatest mass air raids the world had ever seen. During the year 1941, we killed 102,500 fellow Americans through accident alone. In addition, 9,300,000 were injured, 350,000 of them permanently disabled.

The direct ascertainable cost of all these accidents was $4,000,000,000. The indirect costs in human suffering, lowered efficiency, decreased production, etc., cannot be measured.

One out of every 14 persons residing in this country was killed or injured during 1941, and about 4% of the national income went to pay the bill, the National Safety Council reports.

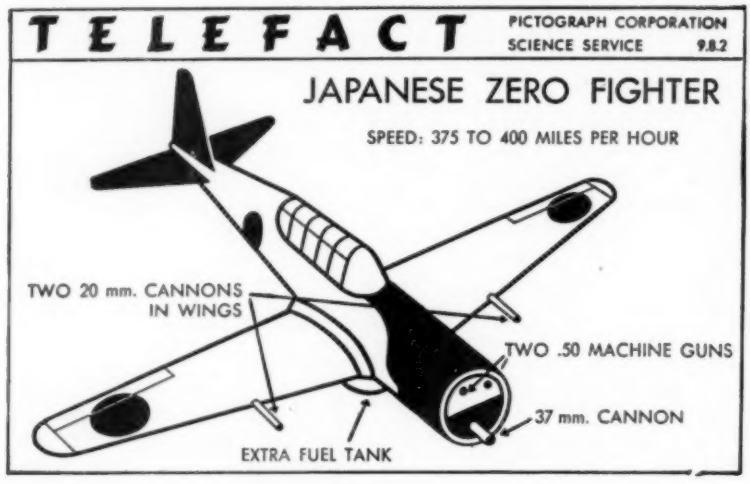
The automobile as usual was the chief offender, rolling up a score of 40,000 dead, and 1,450,000 injured. The bill was about $1,900,000,000.

But accidents in the home were not far behind, killing 31,500, injuring 4,650,000, and costing $600,000,000.

After all, the factory seems the safest place to be. Only 18,000 died, and 1,600,000 were wounded on the production front. But the cost was higher. They are more valuable men. They receive better care so they may return to the front soon. The cost was $850,000,000 and 460,000,000 man-days, or the work that 1,500,000 men would have done throughout the year.

That men working amid whizzing and roaring machinery, white-hot furnaces and on high scaffoldings should be safer than at home or on the streets, is largely due to the fact that workmen, like soldiers, can be trained to protect themselves, to use the safety devices provided, and largely compelled to do so.

Science News Letter, September 26, 1942



POPULATION

Outliving Expected Life

➤ FANTASTIC as it may sound, we are outliving our expectation of life.

Men and women born in 1876, for example, had an expectation of life when they were born of 41.4 and 44.6 years respectively on a statistical basis. But the average length of life for men and women born that year turned out to be 46.3 years for men and 50.6 years for the women, statisticians for the Metropolitan Life Insurance Company point out. The figures are for England and Wales but the principle applies in this country as well.

This extra lease on life has been gained because of the advances of science and the standards of living.

The United States today has 2,900,000 more potential soldiers, men between 20 to 44 years old, than it would have had if it had not been for these life-saving improvements.

Many a man alive today knows that he owes his life to an operation or medical treatment—the sulfa drugs or insulin, for example—which has been developed during his lifetime. Many thousands of others owe their lives more indirectly to the advances of science. Of the 900,000 men and women aged 65 years alive in the United States today, 300,000 owe their lives to such advances. If conditions prevailing at their birth had continued, those 300,000 would not be alive today.

The term "expectation of life" is not always used in its exact sense, the life insurance statisticians point out.

"Strictly speaking," they state, "the expectation of life at any age is the prospective average number of years of life remaining to persons of that age, provided that the death rates at each age remained constant at their prevailing levels. Thus, if we say that the expectation of life for a white male 10 years old in 1940 was 57 years, we mean that the members of the large group of boys of age 10 in that year would, on an average, survive 57 years, if the death rates at each age of life remained unchanged as of 1940."

Science News Letter, September 26, 1942

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One-fifth of the world's population live in *India*.

In Britain, seven ounces of *calcium carbonate* are added to each 280 pounds of wheatmeal flour, the type now used for bread.

Carnauba wax, from the leaves of a Brazilian palm, is highly useful industrially because of its unusual properties, among which is a viscosity three times that of beeswax.

New Machines and Gadgets

❁ *A SELF-LIGHTING acetylene torch is a novel implement for light brazing and soldering. It is shaped like a pistol. Pull the trigger and the torch lights. Release the trigger and the torch goes out. For a longer job, the trigger can be fastened back. You guessed it. The lighting is accomplished in the same way as in cigarette lighters, and a compartment is provided for extra flints.*

Science News Letter, September 26, 1942

❁ *TISSUE PAPER SOAP combines washcloth and soap, providing just enough lather for one thorough washing of the hands. The tissue will stand a good deal of rubbing before disintegrating.*

Science News Letter, September 26, 1942

❁ *A BLACK DIMOUT FABRIC permits business as usual at retail stores along the Atlantic seaboard. The sheer fabric hung on the inside of the window permits the window-shopper to see the merchandise within, but greatly reduces the glare outside.*

Science News Letter, September 26, 1942

❁ *A LACQUER that peels off has been provided for protection of highly polished surfaces during handling or shipping. It can be applied by spraying, brushing or dipping, and dries in a few minutes. After removal, the peelings can be dissolved and used again.*

Science News Letter, September 26, 1942

❁ *HOW IS YOUR PROFILE? Is your back hair in order? You can easily answer both questions at once wherever you are if you carry with you a little device that has recently been patented. It consists of two mirrors in a round, flat box like a lady's compact. The larger mirror is on the inside of the box cover. The second is just large enough to peak into with one eye, and is carried on the end of a rod which telescopes to fit inside the box. Holding this small mirror close to the eye, the position of the other mirror can be adjusted to show either the side or the back of your head.*

Science News Letter, September 26, 1942

❁ *A BANDAGE that can be contracted and stiffened to any desired degree for use in place of a cast, tourniquet, or elastic stocking, has just been patented. It is made of rubber strands which have been coated with a plastic. After the bandage has been wound about the part affected, the plastic can be hardened to the extent desired by treatment with chemicals. The patent specifically covers the process of coating the rubber strands, which previously had not been successful, the inventor states.*

Science News Letter, September 26, 1942

❁ *GLASS JEWELS, for the bearings of miniature electrical instruments, are the shiny objects seen in this picture.*

They are made of a special high-alumina glass, and replace the synthetic sapphires formerly imported from Switzerland, now cut off by the war. Glass jewels were tried some years ago but were replaced by the Swiss sapphires. Now the manufacturers say their new glass jewels are about as good.

Science News Letter, September 26, 1942

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 123.*

Science News Letter, September 26, 1942

NUTRITION

Cider Sauce Returns To Tables; Recipe Given

➤ IN FORMER times New England families were accustomed to make large supplies of boiled cider applesauce for winter use. It would be kept in a barrel in a cold room, where it would be frozen most of the winter. At every meal a bowl full would be melted, and all members of the family would use it with bread and butter, or with doughnuts if these were present. Some were so fond of boiled cider applesauce that they would use it with almost any food, as breakfast cereals, bread puddings, or even on a plate of hash.

The recipe is about as follows:

Boil down sweet cider 3½ to 4 measures into 1. Vessels of large surface, such as graniteware pans, will naturally be most efficient to promote the evaporation.

Pare and core apples, and cut them into quarters or eighths, depending on their size. It requires about 6 pounds of apples for one gallon of unboiled sweet cider.

Stew the prepared apples slowly in a covered dish with the boiled cider until the pieces of apple are soft, but have not entirely lost their shapes.

No sugar is required. The applesauce may be suited to the taste by choosing such kinds of apples as are neither too sweet nor too sour. In old New England practice, the cider was usually made from wild apples or "natural fruit" mixed with Baldwin apples, and was not very sweet. For such cider, families were apt to use two parts of sweet apples to one part of Baldwins, in preparing the pieces to be stewed. But excellent boiled cider applesauce may be made of cider and apples both of the Winesap or equivalent kinds.

Boiled cider applesauce keeps for some days in warm weather outside of the refrigerator, but soon ferments and must be stewed over again. It keeps indefinitely in sealed fruit jars, or in a refrigerator, or if frozen in winter. Its flavor improves with age if prevented from fermenting. Indeed one is quite unprepared by the taste when first made, for the delicious flavor after a week or two.

Science News Letter, September 26, 1942

Worn service *uniforms*, no longer useful in heavy Army duty, are being reconditioned and dyed in Britain, for sale to agricultural workers.

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•First Glances at New Books

➤ THESE TWO BOOKS, THE RISE OF MAMMALS, by George Gaylord Simpson, and TRIUMPH OF THE MAMMALS, by Edwin H. Colbert, (*American Museum of Natural History*, ea. 25c) present beautifully executed restoration drawings of long-gone creatures, with brief but adequate texts by well-known paleontologists, to tell what the pictures are about.

Science News Letter, September 26, 1942

➤ A COMPREHENSIVE (and comprehensible) summary of modern scholastic philosophy's opinion of more recent rival systems is given in Dyns' COSMOLOGY: THE PHILOSOPHICAL STUDY OF THE INORGANIC WORLD, translated by Sidney A. Raemers (*Bruce*, $3.) There is a minimum of technical terminology, so that whether you agree with the author or not, you can at least tell what he is talking about.

Science News Letter, September 26, 1942

➤ HOW THE Greeks of the fifth and fourth centuries B. C. buried their dead is told in NECROLYNTHIA, by David M. Robinson (*Johns Hopkins Press*, $15), which is Part XI of a truly monumental work on the excavations which have been going on for years at Olynthus. It is to be hoped that the jackals at present infesting the region will presently be driven away, permitting scientific work at the site to be resumed.

Science News Letter, September 26, 1942

➤ A SLENDER but very readable book about seashore natural history is ALONG OUR COAST, by Margaret Miller (*Dodd, Mead*, $1.50). Nice thing to read to children—presumably children still like to be read to.

Science News Letter, September 26, 1942

➤ HOW SUBMARINES are built and operated, what they can do and what can be done against them, is simply and understandably told by David C. Woodbury in WHAT THE CITIZEN SHOULD KNOW ABOUT SUBMARINE WARFARE (*Norton*, $2.50).

Science News Letter, September 26, 1942

➤ ARE THEY going to join the passenger pigeon and the heath hen? Or will we, their carelessly destructive wardens, at the last moment rescue them—sea otter and bighorn, California condor and trumpeter swan, and a score of our other near-extinct faunal species whose tragedies are told in FADING TRAILS by a committee of the U. S. Fish and Wildlife Service under the editorship of Daniel B. Beard (*Macmillan*, $3). The heart-stirring beauty of the illustrations alone should move us to action.

Science News Letter, September 26, 1942

➤ DECIDEDLY WORTH an American's reading is Capt. John Langdon-Davies' HOME GUARD FIELDCRAFT MANUAL (*Chemical Pub. Co.*, $2.50), written for Britons who stand "between their loved homes and the war's desolation."

Science News Letter, September 26, 1942

➤ A BOOK suitable for use in classroom teaching, MICROBIOLOGY AND MAN, by Jorgen Birkeland (*Crofts*, $4) is also highly suitable for reading by the interested general reader who wants to know something of the world of invisibly tiny life that swarms around (and within) him, in terms of what it means to him.

Science News Letter, September 26, 1942

➤ HELPFUL information concerning insulation, air conditioners, humidifiers, heaters, plumbing, wiring and other matters is provided in HOW TO REMODEL A HOUSE by an architectural engineer and an architect, J. Ralph Dalzell and Gilbert Townsend (*American Technical Society*, $4.75).

Science News Letter, September 26, 1942

➤ FORTUNATE YOUNGSTERS will have teachers in their grade schools who use ideas such as are contained in SCIENCE EXPERIENCES FOR ELEMENTARY SCHOOLS, by Charles K. Arey (*Teachers College, Columbia Univ.*, 95c). Every classroom becomes a laboratory and every pupil a researcher.

Science News Letter, September 26, 1942

➤ ADVENTURES IN the gentler side of nature, charmingly related by Florence Page Jacques, delightfully illustrated by Francis Lee Jacques; these make up BIRDS ACROSS THE SKY (*Harper*, $2.50).

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Books Just Off the Press

ALLAN AND BRENDA ON A CLIPPER—Joyce Newbill Martin—*Wallace Hebberd*, 51 p., illus., $1. Exciting for 10-year-olds. Authentic with telling illustrations.

ANNUAL REPORT OF THE SMITHSONIAN INSTITUTION—*Govt. Print. Office*, 596 p., illus., $2. The annual review of science progress reprinting significant contributions.

COLLEGE ZOOLOGY — Robert W. Hegner — *Macmillan Co.*, 817 p., illus., $3.75.

COMPARATIVE PSYCHOLOGY (rev. ed.) — Edward L. Thorndike and others—*Prentice-Hall*, 404 p., illus., $4.

THE CYCLOPHORID OPERCULATE LAND MOLLUSKS OF AMERICA — Carlos de la Torre and Joseph P. E. Morrison, *Smithsonian Institution*, 306 p., illus., 65c.

FIRST AID FOR BOYS (second ed.)—Norman B. Cole and Clayton H. Ernst—*Appleton-Century*, 190 p., illus., $2. Good for scouts and juniors. May save your or their lives.

FIRST AID: SURGICAL AND MEDICAL—Warren H. Cole and Charles B. Puestow—*Appleton-Century*, 351 p., illus., $3.

FISCAL PLANNING FOR TOTAL WAR—William Leonard Crum, John F. Fennelly and Lawrence Howard Seltzer—*Nat'l Bur. of Economic Research*, 358 p., $3.

A GENERAL SCIENCE WORKBOOK—Douglass Elliott Weidner—*Cattell*, 216 p., illus., $1.

JUVENILE DELINQUENCY AND URBAN AREAS—Clifford R. Shaw and Henry D. McKay—*Univ. of Chicago Press*, 431 p., maps, $4.50.

THE LAST OF THE SEA OTTERS—Harold McCracken—*Lippincott*, 99 p., illus., $2. Engaging animal juvenile.

A LAYMAN'S GUIDE TO NAVAL STRATEGY—Bernard Brodie—*Princeton Univ. Press*, 291 p., illus., $2.50.

THE MOSQUITOES OF THE SOUTHEASTERN STATES (second ed.)—W. V. King, G. H. Bradley and T. E. McNeel—*Gov't Print. Office*, 96 p., illus., 25c.

POPULAR MECHANICS PHOTO GUIDE — *Popular Mechanics Co.*, 188 p., illus., $1.25.

POPULAR MECHANICS SHOP NOTES—*Popular Mechanics Co.*, 216 p., illus., 50c.

PROCEEDINGS OF THE INDIANA ACADEMY OF SCIENCE — (vol. 51)—P. D. Edwards — *Bookwalter-Ball-Greathouse*, 289 p., $3.

RADIO OVER U. S. A.—Norman Woelfel—*Ohio State Univ. Press*, 39 p., 50c.

STRATEGIC MATERIALS IN HEMISPHERE DEFENSE—M. S. Hessel, W. J. Murphy and F. A. Hessel — *Hastings House*, 235 p., $2.50.

SUPER-ELECTRICITY — Raymond F. Yates—*Appleton-Century*, 165 p., illus., $2. Electronics in gadgetry and in the post-war world.

ULTRA-VIOLET LIGHT AND ITS APPLICATIONS—H. C. Dake and Jack De Ment—*Chemical Publishing Co.*, 209 p., illus., $3.25.

Science News Letter, September 26, 1942

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